

Diesel Fuel Prices



What Consumers Should Know

A PRIMER ON DIESEL FUEL PRICES

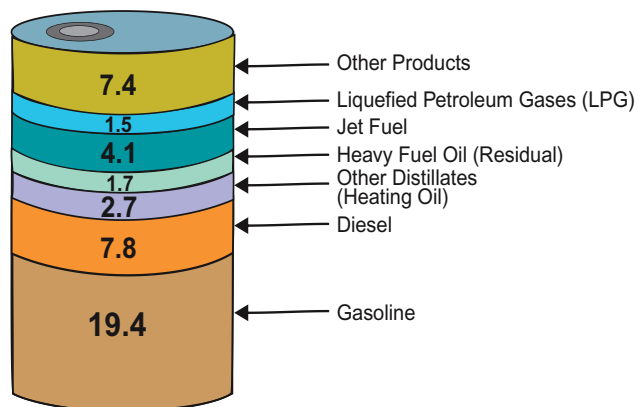
INTRODUCTION

Diesel fuel is the common term for the motor vehicle fuel used in the compression ignition engines named for their inventor, the German engineer Rudolf Diesel, who patented his original design in 1892. While diesel engines are capable of burning a wide variety of fuels (see Biodiesel below), diesel fuel refined from crude oil is the most widely used today. Diesel fuel is important to America's economy, quality of life, and national security. This Energy Information Administration (EIA) brochure discusses the factors that affect and determine diesel fuel prices.

How Diesel Fuel is Made

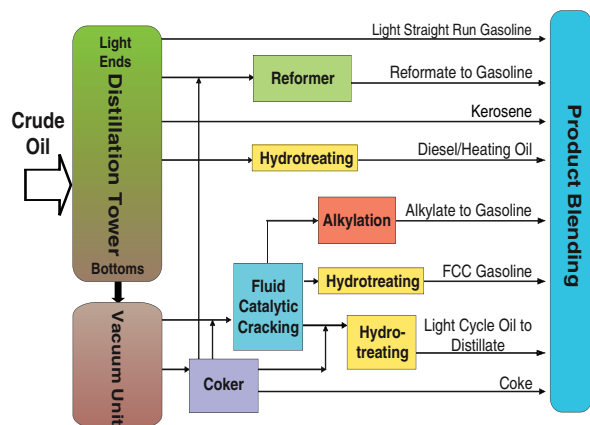
Petroleum diesel is a "distillate" refined from crude oil. There are various grades or types of distillates, but Number 2 (No. 2) distillate is the primary source for the motor diesel consumed in the United States. It is also used as a fuel oil for heating buildings and by industry. On-highway diesel fuel is No. 2 distillate with a sulfur content of no more than 500 parts per million by weight. New standards for reduced sulfur content of on- and off-highway diesel fuel will begin to phase-in in mid-2006 (see the Outlook below). U.S. petroleum refineries produce an average of 7 to 8 gallons of diesel fuel from each 42-gallon barrel of crude oil.

Figure 1. Products Made from a Barrel of Crude Oil (Gallons)



Source: Energy Information Administration.
Notes: A 42-U.S. gallon barrel of crude oil yields slightly more than 44 gallons of petroleum products. This is an average breakdown for a barrel and will vary based on a number of factors.

Figure 2. Basic Petroleum Refining Process



Source: Energy Information Administration.

How Diesel Fuel is Used

Nearly all semi-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm, construction, and military vehicles and equipment have diesel engines. In 2005, diesel fuel accounted for about 15 percent of total refined petroleum products and 75 percent of the total distillate consumed in the United States. On-highway motor vehicles use about 80 percent of total diesel fuel, with off-highway vehicles, construction and farming equipment and diesel-electric generators consuming the rest.¹

¹Sources: Energy Information Administration, *Petroleum Supply Monthly*, February 2006, with data for December 2005 and *Fuel Oil and Kerosene Sales 2004*.

Where Diesel Fuel Comes From and How It is Supplied to Retailers

Most diesel fuel consumed in the United States is produced in U.S. refineries. In 2005, about 5 percent was imported from foreign countries, mainly Canada and the Virgin Islands. U.S. refineries produce diesel fuel from crude oil, of which about 65 percent was imported in 2005. Most diesel fuel is transported by pipeline (some by barge and rail) from refineries and ports to terminals near major consuming areas, where it is loaded into tanker trucks for delivery to individual refueling stations.

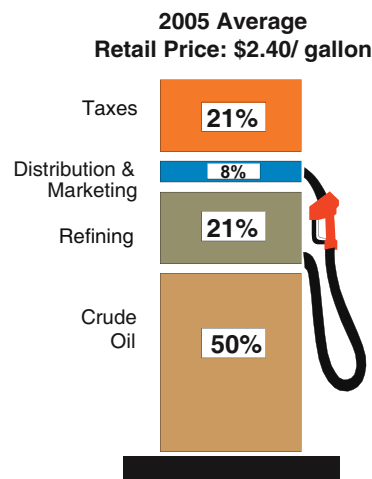
WHAT ARE THE COMPONENTS OF THE RETAIL PRICE OF DIESEL FUEL?

The cost to produce and deliver diesel to consumers includes the costs of crude oil, refinery processing, marketing and distribution, and retail station operation. The retail pump price reflects these costs and the profits (and sometimes losses) of the refiners, marketers, distributors, and retail station owners. The relative share of these cost components to the retail price varies over time and among

FACTORS BEHIND THE DRAMATIC DIESEL FUEL PRICE INCREASE IN 2005

2005 began with high global oil demand that applied intense pressure on the entire petroleum market system, from oil production to transportation (tankers and pipelines) to refinery capacity. The spot price of West Texas Intermediate (WTI) crude oil averaged about \$47 per barrel in January and increased to an average of about \$59 per barrel in July. Then Hurricanes Katrina and Rita delivered a one-two punch to the oil production and refining infrastructure in the Gulf of Mexico and coastal areas of Texas and Louisiana, causing widespread damage and taking oil production and refining offline for weeks. Katrina initially took out more than 25 percent of U.S. crude oil production and 10-15 percent of U.S. refinery capacity. Major oil pipelines that feed the Midwest and the East Coast were also shut down or forced to operate at reduced rates for a significant period. The impact on prices was dramatic: WTI crude spot prices reached a high of nearly \$70 per barrel in early September. Retail on-highway diesel fuel prices experienced similar increases, from a national average of \$1.96 per gallon on January 3rd, to \$2.59 per gallon on August 29th, to a high of \$3.16 on October 24th following hurricane Rita. After hurricanes Katrina and Rita, supplies were bolstered by repairs to damaged facilities, loans and releases from the U.S. Strategic Petroleum Reserve, and by increased imports, in part from emergency releases of inventories in Europe by the International Energy Agency. This contributed to a fall in retail prices and by December 26th, the U.S. average retail diesel fuel price had dropped to about \$2.45 per gallon. However, at the end of December 2005, oil production in the Gulf was only at about 75 percent of pre-hurricane levels, and two major refineries were still shut down and another two were working at well below full capacity.

Figure 3. What We Pay at the Pump for a Gallon of Diesel Fuel



Source: Energy Information Administration.

regions of the country. Figure 3 illustrates the percentage share for each major cost element of the national average retail price in 2005. The price on the pump also includes Federal, State, and local taxes. In 2005, Federal excise taxes were 24.4 cents per gallon, and State excise taxes averaged about 21.6 cents per gallon.² Some States and county and city governments levy additional taxes. The retail price also reflects local market conditions and factors such as the location and the marketing strategy of the owner. Some retail outlets are owned and operated by refiners, while others are independent businesses that purchase diesel fuel for resale to the public.

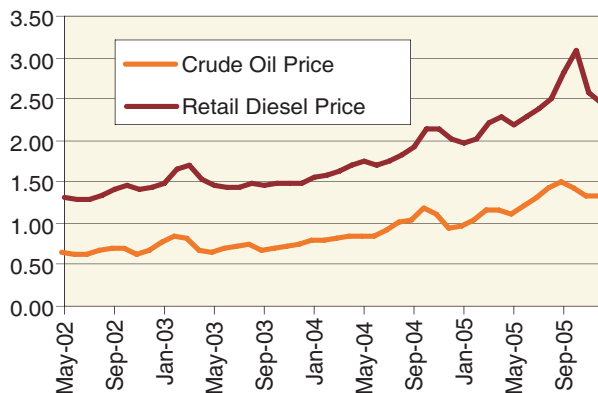
²Energy Information Administration, *Petroleum Marketing Monthly*, February 2006, Explanatory Notes, Table EN1.

WHAT ARE THE MAIN FACTORS THAT AFFECT DIESEL FUEL PRICES?

Besides excise taxes, the following are the main factors that affect diesel fuel prices:

Cost and supply of crude oil: Crude oil prices are determined by worldwide supply and demand, and over the past few years increasing demand has put intense pressure on available supplies. The Organization of Petroleum Exporting Countries (OPEC) has significant influence on prices by setting an upper production limit on its members who produce about 40 percent of the world's crude oil, have essentially all of the spare production capacity, and possess about two-thirds of the world's estimated crude oil reserves. Prices spike in response to disruptions in the international and domestic supply of crude oil, such as the oil embargo in 1973, the Iran/Iraq war in 1980, the current war in Iraq, and the 2005 hurricanes in the Gulf of Mexico.

Figure 4. Diesel Fuel Prices Follow Crude Oil



Source: Energy Information Administration.

Tight refining capacity and international diesel fuel demand: U.S. refineries have been operating at above 90 percent capacity over the last 10 years. Most other countries rely even more heavily on distillates and diesel for transportation than does the United States, and refining capacity is tight worldwide. U.S. diesel fuel prices are more and more affected by competing international demand for refined distillates.

Product supply/demand imbalances: Prices of transportation fuels are generally more volatile than prices of other commodities because the U.S. transportation fleet is so heavily dependent on petroleum and few alternative fuels are available. If supply declines unexpectedly due to refinery problems or lagging imports, diesel inventories (stocks) may decline rapidly. When stocks are low and falling, some wholesalers and marketers may bid higher for the available product. If the transportation system cannot support the flow of surplus supplies from one region to another quickly, prices will remain comparatively high. These are normal price fluctuations experienced in all commodity markets.

Seasonality in the demand for diesel fuel and distillates: While U.S. diesel demand is fairly consistent and generally reflects the overall health of the economy, prices tend to gradually rise during the fall, decline in the late winter, rise through the early spring, and then drop a bit in the summer. Diesel fuel use by farmers and for transporting goods for stores to build inventories during the winter holiday season, as well as cold weather in the Northeast where most heating fuel oil is consumed, can apply upward pressure on diesel prices.

Transportation costs: Transportation costs generally increase with increasing distance between the retail location and distribution terminals and refineries. Areas farthest from the Gulf Coast (the source of nearly half of the diesel fuel produced in the United States) tend to have higher prices.

Regional operating costs and local competition: The cost of doing business by individual dealers can vary greatly depending on where the dealer is located. These costs include wages and salaries, benefits, equipment, lease/rent, insurance, overhead, and State and local fees. Even retail stations next to each other can have different traffic patterns, rents, and sources of supply that affect their prices. The number and location of local competitors can also affect prices.

OUTLOOK FOR 2006 AND 2007

Retail diesel fuel prices are likely to remain elevated as long as some Gulf of Mexico refineries remain shut down and the U.S. distillate market continues to stretch supplies to the limit. As of May 2006, EIA expects that national average retail diesel fuel prices will hover around \$2.70

WHY ARE WEST COAST DIESEL FUEL PRICES HIGHER AND MORE VARIABLE THAN OTHERS?

Diesel prices on the West Coast, especially in California, are relatively higher than other regions of the country, partly because of taxes, but mainly because of supply issues. The State of California assesses a combined State and local sales and use tax of 7.25 percent on top of the 24.4 cents per gallon Federal excise tax and an 18.0 cents per gallon State tax. Washington's tax of 31 cents per gallon is one of the highest in the country. Besides taxes, West Coast retail prices are more variable than others because there are relatively few supply sources: 21 of the 36 refineries located in West Coast States are in California. California refineries need to be running at near full capacity just to meet in-state demand. If more than one refinery in the region experiences operating difficulties at the same time, the diesel supply may become very tight and prices may spike. The West Coast's substantial distance from Gulf Coast and foreign refineries is such that any unusual increase in demand or reduction in supply results in a large price response in the market before relief supplies can be delivered. The farther away the necessary relief supplies are, the higher and longer the price spike will be.

per gallon through 2006 and 2007, primarily due to the forecast for the price of West Texas Intermediate crude oil to average about \$68 per barrel in 2006 and 2007.

The phase-in of the U.S. Environmental Protection Agency's (EPA) ultra-low-sulfur diesel (ULSD) standard of no more than 15 parts per million sulfur by weight for on-highway diesel fuel also has the potential to influence diesel prices. (Reduced sulfur content standards for off-highway diesel fuel begin phasing-in in 2007.) While refinery modifications necessary for producing ULSD are largely on track, delivery to retail outlets may be the biggest challenge. Most ULSD will travel through pipelines on the way to bulk terminals for final transfer by tanker truck to retail stations. Other petroleum products with a higher-sulfur content in the pipeline, storage, and local distribution systems could contaminate ULSD (jet fuel, for example, can have 3,000 parts per million of sulfur). It may not be possible to correct a diesel batch by blending with additional low-sulfur product, and it may have to be returned to a refinery for reprocessing, a difficult and expensive problem. Even without potential delivery problems, the price of diesel is likely to increase due to the higher cost of producing ULSD.

FUEL SURCHARGES

Many transportation companies and freight carriers include a fuel-cost surcharge in their rates and invoices to cover increases in the cost of diesel fuel. There is no Federal regulation of fuel surcharges, and EIA does not calculate fuel surcharges or review fuel surcharge formulas. Companies that apply surcharges use their own formula for calculating their surcharge. EIA's retail diesel price data (see

below) are often cited as a reference by companies that have fuel surcharges. There is information on one way to calculate and implement a fuel surcharge on the Web site of the Owner-Operator Independent Drivers Association (no endorsement or recommendation implied): www.ooida.com

DOE WEEKLY RETAIL ON-HIGHWAY DIESEL FUEL PRICE SURVEY

Every Monday, EIA conducts a survey of retail on-highway diesel prices by telephone and fax from a sample of approximately 350 truck stops and service stations around the country. The survey results are published by 5:00 pm Monday (or on Tuesday when there is a Federal holiday on Monday). The results are compiled into a U.S. average price and average prices for eight regions of the country and California. These survey results are made available through EIA's Motor Fuels Price Hotline (202-586-6966), EIA's Web page, and by E-mail listserves (regular and wireless). The Web page where you can access the results as well as details on the survey is: <http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp>

BIODIESEL

One of the fuels that Rudolf Diesel originally considered for his engine was vegetable seed oil, an idea that is now coming back as so-called "biodiesel." Biodiesel can be manufactured from vegetable oils, animal fats, or recycled restaurant grease. It is biodegradable and can reduce vehicle emissions of particulates, carbon monoxide, and hydrocarbons. Blends of 20 percent biodiesel with 80 percent petroleum diesel (B20) can generally be used in unmodified diesel engines. Biodiesel may be one of the "additives" used to improve lubricity of ULSD, which will be negatively affected by the removal of sulfur to meet the ULSD standards. Biodiesel production increased from very little 10 years ago to about 75 million gallons in 2005, most of which was produced from soybean oil at about 35 major facilities and sold by 1,400 distributors and 450 retail stations (source: National Biodiesel Board; www.biodiesel.org). More information on biodiesel is available on the Web site of DOE's Office of Energy Efficiency and Renewable Energy at: www.eere.gov/afdc/altfuel/biodiesel.html

For more information, you may contact:

National Energy Information Center
Energy Information Administration

1000 Independence Ave., SW, Washington, DC 20585

Phone: 202-586-8800, 9:00am-5:00pm Eastern time.

E-mail: infoctr@eia.doe.gov---normal response is 3 business days.

Other consumer-oriented brochures can be accessed on the Web at:

<http://tonto.eia.doe.gov/reports/reportsA.asp?type=other>

EIA's Web Site: www.eia.doe.gov